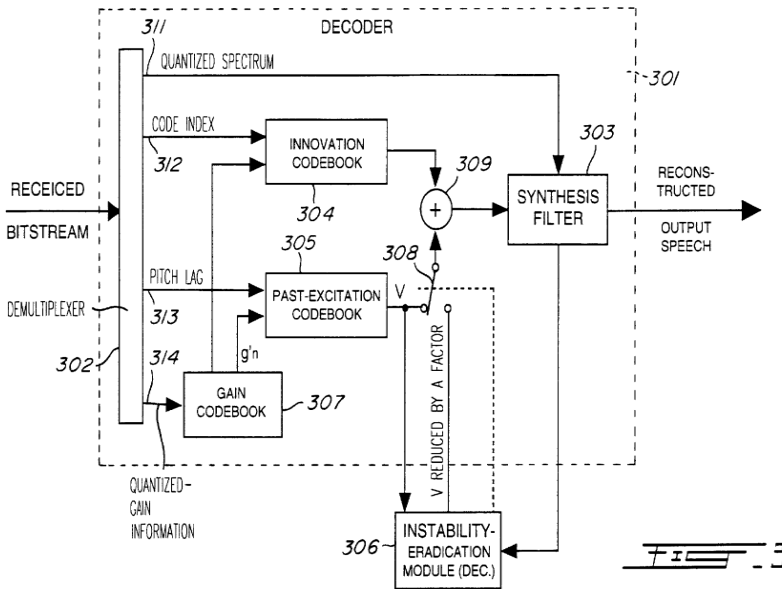


APPENDIX 7-B
U.S. PATENT 6,104,992 IS INVALID UNDER 35 U.S.C. 102
IN LIGHT OF U.S. PATENT 5,893,060 (“the ‘060 patent”)

Claims	Invalidity Based on US 5,893,060
<p>1[a]. A speech system using an analysis by synthesis approach on a speech signal, the speech system comprising:</p>	<p>To the extent this limitation is satisfied by the functionality accused in Plaintiff’s 11/23/09 infringement contentions, this limitation is disclosed in the prior art. For example, without limitation, the ‘060 patent discloses:</p> <p style="padding-left: 40px;">A method and device eradicate the occasional instability inherent in analysis-by-synthesis speech/audio codecs and caused in particular by channel errors during transmission of highly periodic signals such as high-frequency sine waves. Analysis-by-synthesis techniques involve production, in response to the speech/audio signal and at regular time intervals called frames, of (a) a set of spectral parameters for use in driving a synthesis filter in view of synthesizing the speech/audio signal, and (b) a pitch gain for constructing a past-excitation-signal component supplied to the synthesis filter. In accordance with the instability eradication method, the first step consists of detecting a set of conditions including (i) a resonance condition assessed from the spectral parameters, (ii) a duration condition detected when the resonance condition has prevailed for at least the M most recent frames, M being an integer greater than 1, and (iii) a gain condition which evidences consistently-high values of the pitch gain in the N most recent frames, N being an integer greater than 1. To eradicate the occasional instability, the pitch gain is reduced to a value lower than a given threshold whenever these three conditions are detected.</p> <p>‘060 Patent, Abstract.</p> <p style="padding-left: 40px;">The present invention is concerned with the field of digital encoding of speech, audio and other signals based on analysis-by-synthesis techniques including, in particular but not exclusively, Multipulses, Code Excited Linear Prediction (CELP) and Algebraic-Code Excited Linear Prediction (ACELP). More specifically, the present invention relates to the eradication of an occasional instability found in these analysis-by-synthesis techniques.</p> <p>‘060 Patent, 1:8-16.</p>
<p>[1b] an adaptive codebook;</p>	<p>To the extent this limitation is satisfied by the functionality accused in Plaintiff’s 11/23/09 infringement contentions, this limitation is disclosed in the prior art. For example, without limitation, the ‘060 patent discloses:</p>

APPENDIX 7-B
U.S. PATENT 6,104,992 IS INVALID UNDER 35 U.S.C. 102
IN LIGHT OF U.S. PATENT 5,893,060 (“the ‘060 patent”)

Claims	Invalidity Based on US 5,893,060
	 <p>'060 Patent, Fig. 3.</p> <p>The decoder 301 of FIG. 3 comprises a demultiplexer 302 for demultiplexing the bitstream received from the encoder 101 of FIG. 1 into a quantized spectrum 311 (corresponding to transmitted spectrum 111), a code index 312 (corresponding to transmitted code index 112), a pitch lag 313 (corresponding to transmitted pitch lag 113) and to quantized-gain information 314 (corresponding to transmitted quantized gains 114). The reconstructed speech is outputted from a synthesis filter 303. This synthesis filter 303 is excited by the sum of two components, namely (a) a codevector from an innovation codebook 304 in response to the code index information 312 and the code gain extracted from the quantized gain information 314 by a gain codebook 307, and (b) a past-excitation component v from a past-excitation-codebook 305 in response to the received pitch-lag information 313 and the pitch gain retrieved by the gain codebook 307 from the quantized-gain information 314. The spectrum 311 is also used to drive the synthesis filter 303. More specifically, a periodic excitation signal is applied to the synthesis filter 303 to produce the desired output speech, this periodic excitation signal being constructed by adding the received innovation signal to a past-excitation-signal</p>

APPENDIX 7-B
U.S. PATENT 6,104,992 IS INVALID UNDER 35 U.S.C. 102
IN LIGHT OF U.S. PATENT 5,893,060 (“the ‘060 patent”)

Claims	Invalidity Based on US 5,893,060
	<p>component, more precisely to the excitation signal a pitch-lag ago multiplied by the pitch gain. Whenever the frame duration is longer than the pitch lag, the frame is filled by repeating the past excitation according to the well known adaptive codebook technique.</p> <p>‘060 Patent, 6:58-7:17.</p>
<p>[1c] a fixed codebook;</p>	<p>To the extent this limitation is satisfied by the functionality accused in Plaintiff’s 11/23/09 infringement contentions, this limitation is disclosed in the prior art. For example, without limitation, the ‘060 patent discloses:</p> <div data-bbox="903 633 1617 1185" data-label="Diagram"> </div> <p>‘060 Patent, Fig. 3.</p> <p>The decoder 301 of FIG. 3 comprises a demultiplexer 302 for demultiplexing the bitstream received from the encoder 101 of FIG. 1 into a quantized spectrum 311 (corresponding to transmitted spectrum 111), a code index 312 (corresponding to transmitted code index 112), a pitch lag 313 (corresponding to transmitted pitch lag 113) and to quantized-gain information 314 (corresponding to transmitted quantized gains 114). The reconstructed speech is outputted from a synthesis filter 303. This synthesis filter 303 is excited by the sum of</p>

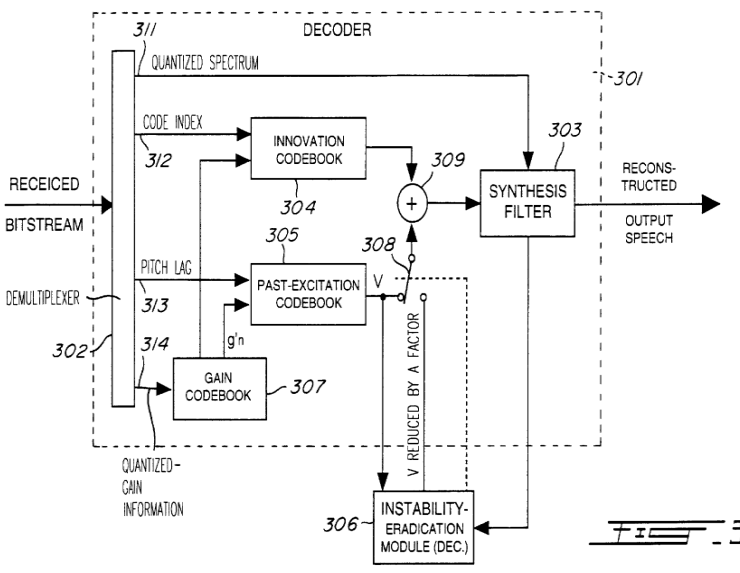
APPENDIX 7-B
U.S. PATENT 6,104,992 IS INVALID UNDER 35 U.S.C. 102
IN LIGHT OF U.S. PATENT 5,893,060 (“the ‘060 patent”)

Claims	Invalidity Based on US 5,893,060
	<p>two components, namely (a) a codevector from an innovation codebook 304 in response to the code index information 312 and the code gain extracted from the quantized gain information 314 by a gain codebook 307, and (b) a past-excitation component v from a past-excitation-codebook 305 in response to the received pitch-lag information 313 and the pitch gain retrieved by the gain codebook 307 from the quantized-gain information 314. The spectrum 311 is also used to drive the synthesis filter 303. More specifically, a periodic excitation signal is applied to the synthesis filter 303 to produce the desired output speech, this periodic excitation signal being constructed by adding the received innovation signal to a past-excitation-signal component, more precisely to the excitation signal a pitch-lag ago multiplied by the pitch gain. Whenever the frame duration is longer than the pitch lag, the frame is filled by repeating the past excitation according to the well known adaptive codebook technique.</p> <p>‘060 Patent, 6:58-7:17.</p>
<p>[1d] a processing circuit that sequentially identifies a first gain applied to the adaptive codebook and a second gain applied to the fixed codebook; and</p>	<p>To the extent this limitation is satisfied by the functionality accused in Plaintiff’s 11/23/09 infringement contentions, this limitation is disclosed in the prior art. For example, without limitation, the ‘060 patent discloses:</p> <p style="padding-left: 40px;">Analysis-by-synthesis speech encoding techniques are based on a speech production model involving as shown in FIG. 1 the production of:</p> <p style="padding-left: 40px;">(a) a quantized spectrum 111 described by a set of P spectral coefficients, where P is the order;</p> <p style="padding-left: 40px;">(b) a description of an innovation signal typically by way of a code index 112 and a code gain (included in the quantized-gain information 114);</p> <p style="padding-left: 40px;">(c) a pitch lag 113; and</p> <p style="padding-left: 40px;">(d) a pitch gain (included in the quantized gains 114).</p> <p>‘060 Patent, 6:43-53.</p>

APPENDIX 7-B
U.S. PATENT 6,104,992 IS INVALID UNDER 35 U.S.C. 102
IN LIGHT OF U.S. PATENT 5,893,060 (“the ‘060 patent”)

Claims	Invalidity Based on US 5,893,060
	<p>'060 Patent, Fig. 1.</p>

APPENDIX 7-B
U.S. PATENT 6,104,992 IS INVALID UNDER 35 U.S.C. 102
IN LIGHT OF U.S. PATENT 5,893,060 (“the ‘060 patent”)

Claims	Invalidity Based on US 5,893,060
	 <p>The diagram illustrates a speech decoder system. A 'RECEIVED BITSTREAM' enters a 'DEMULTIPLEXER' (302). The demultiplexer outputs four signals: 'QUANTIZED SPECTRUM' (3/1), 'CODE INDEX' (3/2), 'PITCH LAG' (3/3), and 'QUANTIZED-GAIN INFORMATION' (3/4). The 'QUANTIZED SPECTRUM' (3/1) is fed into a 'SYNTHESIS FILTER' (303). The 'CODE INDEX' (3/2) is fed into an 'INNOVATION CODEBOOK' (304). The 'PITCH LAG' (3/3) is fed into a 'PAST-EXCITATION CODEBOOK' (305). The 'QUANTIZED-GAIN INFORMATION' (3/4) is fed into a 'GAIN CODEBOOK' (307). The output of the 'INNOVATION CODEBOOK' (304) is multiplied by a gain factor g^n and then added to the output of the 'PAST-EXCITATION CODEBOOK' (305) at a summing junction (309). The output of the 'GAIN CODEBOOK' (307) is multiplied by a factor V (308) and then added to the output of the summing junction (309). The output of the summing junction (309) is fed into the 'SYNTHESIS FILTER' (303). The output of the 'SYNTHESIS FILTER' (303) is the 'RECONSTRUCTED OUTPUT SPEECH'. An 'INSTABILITY-ERADICATION MODULE (DEC.)' (306) receives input from the 'SYNTHESIS FILTER' (303) and outputs a signal 'V REDUCED BY A FACTOR' back to the summing junction (309). The entire system is labeled 'DECODER' (301).</p> <p>'060 Patent, Fig. 3.</p>
<p>[1e] the processing circuit identifies a gain reduction factor applied to the first gain identified, the gain reduction factor is used by the processing circuit to perform the identification of the second gain.</p>	<p>To the extent this limitation is satisfied by the functionality accused in Plaintiff's 11/23/09 infringement contentions, this limitation is disclosed in the prior art. For example, the '060 patent discloses a processing circuit (<i>e.g.</i>, Speech Encoder/Decoder of Figures 1-3) that "identifies" a gain threshold value G_T which, under certain conditions, is "applied" to the adaptive (past-excitation) codebook gain g. The '060 patent further discloses that, in some embodiments, the adaptive codebook gain g and the fixed (innovation) codebook gain x are jointly quantized using a vector quantization technique. <i>See e.g.</i>, Step 211 of Fig. 2. In such situations, the vector quantized value of the fixed codebook gain x will be based in part on the value of the adaptive codebook gain g. Thus, in situations where the adaptive codebook gain g is limited by the gain threshold value G_T, it follows that the Speech Encoder/Decoder uses the gain threshold value G_T to "identify" the quantized value the fixed codebook gain x, which is used to generate the contribution from the fixed (innovation) codebook as shown in Figure 3. For example, without limitation, the '060 patent discloses:</p> <p style="padding-left: 40px;">According to the invention, the instability eradication method comprises a detection step for detecting a set of</p>

APPENDIX 7-B
U.S. PATENT 6,104,992 IS INVALID UNDER 35 U.S.C. 102
IN LIGHT OF U.S. PATENT 5,893,060 (“the ‘060 patent”)

Claims	Invalidity Based on US 5,893,060
	<p>conditions related to the spectral parameters and the pitch gain, and a modification step for reducing the pitch gain to a value lower than a given threshold whenever the conditions of the above mentioned set are detected in order to eradicate the occasional instability.</p> <p>’060 Patent, 2:18-24.</p> <p>The modification step may comprise the step of reducing a quantized version of the pitch gain to a value lower than a given threshold G_T whenever the conditions of the above mentioned set are detected in order to eradicate the occasional instability.</p> <p>’060 Patent, 2:44-48.</p> <p>Switch 110 is normally in the position as shown in FIG. 1. In this case, the instability-eradication module 105 does not interfere with normal operation of the encoder 101; indeed the pitch gain g outputted from module 103 is passed untouched to the quantization module 104. If however, the instability-eradication module 105 identifies a problem potential, it will change the position of switch 110 thereby saturating the current pitch gain g to some value (e.g.: G_T) and will cause the quantized pitch gain included in the output of gain vector-quantization module 104 to be limited to a value lower than a given threshold (e.g.: G_T).</p> <p>’060 Patent, 7:50-60.</p> <p>The instability-eradication module 105 is used in conjunction with the encoder 101. Its purpose is to identify frames with problem potential and, whenever such frames occur, to saturate the current pitch gain g to a given value and to cause the quantized version of the pitch gain to assume a value lower than unity in the vector quantization process. This result is best obtained by limiting the vector-quantizer search range to those entries for which the corresponding quantized pitch gain assumes indeed the above mentioned value lower than unity.</p> <p>A frame with problem potential is identified whenever the three following conditions are detected:</p> <p>1) A resonance condition prevails in the input signal to be encoded. In other words a highly correlated stationary signal is present. A typical signal having these characteristics is a sinusoidal tone or a combination of tones. The present specification discloses an efficient approach to assessing resonance conditions by monitoring the occurrence of resonance in the LSP-spectrum already available in the encoder.</p>

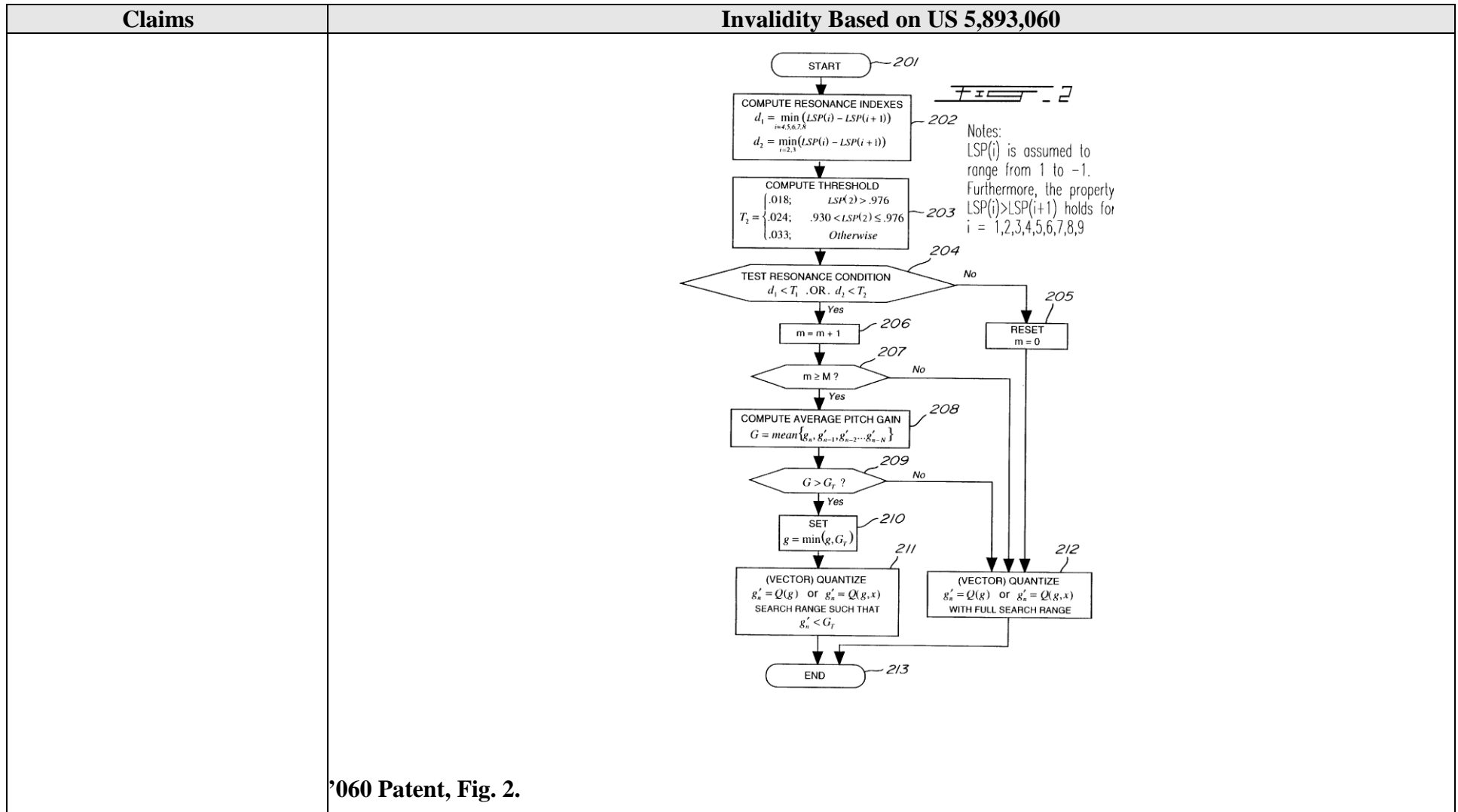
APPENDIX 7-B
U.S. PATENT 6,104,992 IS INVALID UNDER 35 U.S.C. 102
IN LIGHT OF U.S. PATENT 5,893,060 (“the ‘060 patent”)

Claims	Invalidity Based on US 5,893,060
	<p>2) A duration condition is detected when the resonance condition has prevailed for at least the M most recent frames where M is an integer greater than 1; a typical value for M is 12.</p> <p>3) A gain condition which evidences consistently-high values of the pitch gain in the N most recent frames, N being an integer greater than 1. For example, a consistently-high pitch-gain condition is detected when the average pitch gain computed over the most recent N+1 pitch-gain values exceeds a given threshold; a typical value for N is 7.</p> <p>'060 Patent, 8:30-60.</p> <p>Gain condition</p> <p>Step 209 detects a problem potential by detecting the consistently-high pitch-gain condition when the average G of the pitch gain over the N most recent frames, computed in step 208, is higher than a fixed threshold G_T, where 0.95 is a typical value for G_T according to the implementation illustrated in step 208.</p> <p>'060 Patent, 9:49-55.</p> <p>If a problem potential is detected</p> <p>Step 210 saturates the pitch gain g to G_T or another threshold (a simpler variant for step 210 consists of setting $g = G_T$ because g is expected to be large on entering this step).</p> <p>The quantization operation of step 211 takes place in vector-quantization module 104 under instructions from the instability-eradication module 105 to limit the search range to codevectors corresponding to quantized pitch gains lower than G_T or similar value.</p> <p>'060 Patent, 9:62-10:3.</p> <p>The instability-eradication module 105 is used in conjunction with the encoder 101. Its purpose is to identify frames with problem potential and, whenever such frames occur, to saturate the current pitch gain g to a given value and to cause the quantized version of the pitch gain to assume a value lower than unity in the vector quantization process. This result is best obtained by limiting the vector-quantizer search range to those entries for which the corresponding quantized pitch gain assumes indeed the above mentioned value lower than unity.</p>

APPENDIX 7-B
U.S. PATENT 6,104,992 IS INVALID UNDER 35 U.S.C. 102
IN LIGHT OF U.S. PATENT 5,893,060 (“the ‘060 patent”)

Claims	Invalidity Based on US 5,893,060
	<p>'060 Patent, 8:30-39.</p> <p>In essence, steps 201 through 204 determine whether or not a resonance condition prevails in the input speech signal to be encoded. If a resonance condition is detected, steps 206 and 207 determine whether the duration, during which the resonance condition has been prevailing, exceeds a given number of frames (duration condition). If this duration condition is detected, a problem potential is recognized if the (weighted) average pitch gain is above a given threshold and the current pitch gain is above a certain threshold G_T. When a problem potential is recognized, the quantized pitch gain g'_n is caused to stay below a certain threshold (e.g.: G_T) in step 211 by limiting the search range of the vector quantization module 104 (FIG. 1).</p> <p>'060 Patent, 9:1-14.</p>

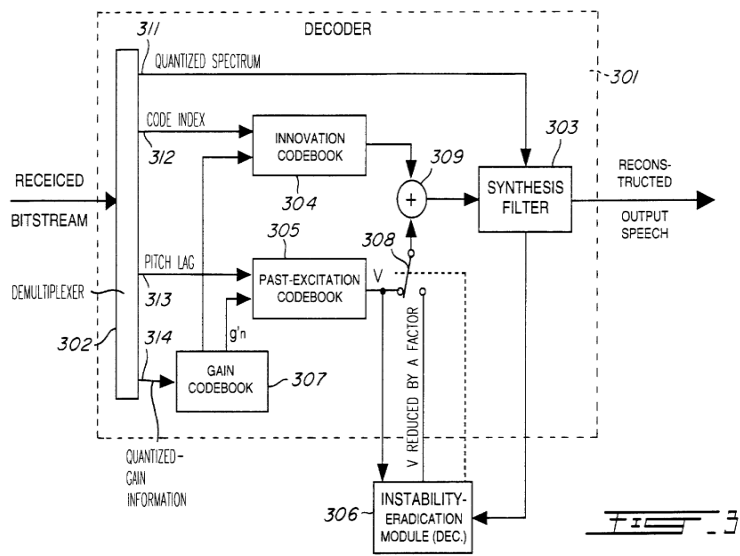
APPENDIX 7-B
U.S. PATENT 6,104,992 IS INVALID UNDER 35 U.S.C. 102
IN LIGHT OF U.S. PATENT 5,893,060 (“the ‘060 patent”)



APPENDIX 7-B
U.S. PATENT 6,104,992 IS INVALID UNDER 35 U.S.C. 102
IN LIGHT OF U.S. PATENT 5,893,060 (“the ‘060 patent”)

Claims	Invalidity Based on US 5,893,060
	<p>'060 Patent, Fig. 1.</p>

APPENDIX 7-B
U.S. PATENT 6,104,992 IS INVALID UNDER 35 U.S.C. 102
IN LIGHT OF U.S. PATENT 5,893,060 (“the ‘060 patent”)

Claims	Invalidity Based on US 5,893,060
	 <p>The diagram illustrates a speech decoder system (Fig. 3). A 'RECEIVED BITSTREAM' enters a 'DEMULTIPLEXER' (302). The demultiplexer outputs four signals: 'QUANTIZED SPECTRUM' (311), 'CODE INDEX' (312), 'PITCH LAG' (313), and 'QUANTIZED-GAIN INFORMATION' (314). The 'QUANTIZED SPECTRUM' (311) is input to a 'SYNTHESIS FILTER' (303). The 'CODE INDEX' (312) is input to an 'INNOVATION CODEBOOK' (304). The 'PITCH LAG' (313) is input to a 'PAST-EXCITATION CODEBOOK' (305). The 'QUANTIZED-GAIN INFORMATION' (314) is input to a 'GAIN CODEBOOK' (307). The outputs of the 'INNOVATION CODEBOOK' (304) and the 'PAST-EXCITATION CODEBOOK' (305) are summed at a junction (309). The output of this junction is then multiplied by a factor 'V' (308) to produce 'V REDUCED BY A FACTOR'. This signal is then input to the 'SYNTHESIS FILTER' (303). The output of the 'SYNTHESIS FILTER' (303) is 'RECONSTRUCTED OUTPUT SPEECH'. Additionally, the 'QUANTIZED-GAIN INFORMATION' (314) is input to an 'INSTABILITY-ERADICATION MODULE (DEC.)' (306), which outputs a signal to the 'GAIN CODEBOOK' (307). The entire system is labeled 'DECODER' (301).</p> <p>'060 Patent, Fig. 3.</p>
<p>2. The speech system of claim 1 wherein the gain reduction factor comprises an adaptive gain factor.</p>	<p>To the extent this limitation is satisfied by the functionality accused in Plaintiff's 11/23/09 infringement contentions, this limitation is disclosed in the prior art. For example, without limitation, the '060 patent discloses:</p> <p>According to the invention, the instability eradication method comprises a detection step for detecting a set of conditions related to the spectral parameters and the pitch gain, and a modification step for reducing the pitch gain to a value lower than a given threshold whenever the conditions of the above mentioned set are detected in order to eradicate the occasional instability.</p> <p>'060 Patent, 2:18-24.</p> <p>The modification step may comprise the step of reducing a quantized version of the pitch gain to a value lower than a given threshold $G_{sub.T}$ whenever the conditions of the above mentioned set are detected in order to</p>

APPENDIX 7-B
U.S. PATENT 6,104,992 IS INVALID UNDER 35 U.S.C. 102
IN LIGHT OF U.S. PATENT 5,893,060 (“the ‘060 patent”)

Claims	Invalidity Based on US 5,893,060
	<p>eradicate the occasional instability.</p> <p>’060 Patent, 2:44-48.</p> <p>Switch 110 is normally in the position as shown in FIG. 1. In this case, the instability-eradication module 105 does not interfere with normal operation of the encoder 101; indeed the pitch gain g outputted from module 103 is passed untouched to the quantization module 104. If however, the instability-eradication module 105 identifies a problem potential, it will change the position of switch 110 thereby saturating the current pitch gain g to some value (e.g.: G_T) and will cause the quantized pitch gain included in the output of gain vector-quantization module 104 to be limited to a value lower than a given threshold (e.g.: G_T).</p> <p>’060 Patent, 7:50-60.</p> <p>The instability-eradication module 105 is used in conjunction with the encoder 101. Its purpose is to identify frames with problem potential and, whenever such frames occur, to saturate the current pitch gain g to a given value and to cause the quantized version of the pitch gain to assume a value lower than unity in the vector quantization process. This result is best obtained by limiting the vector-quantizer search range to those entries for which the corresponding quantized pitch gain assumes indeed the above mentioned value lower than unity.</p> <p>A frame with problem potential is identified whenever the three following conditions are detected:</p> <ol style="list-style-type: none"> 1) A resonance condition prevails in the input signal to be encoded. In other words a highly correlated stationary signal is present. A typical signal having these characteristics is a sinusoidal tone or a combination of tones. The present specification discloses an efficient approach to assessing resonance conditions by monitoring the occurrence of resonance in the LSP-spectrum already available in the encoder. 2) A duration condition is detected when the resonance condition has prevailed for at least the M most recent frames where M is an integer greater than 1; a typical value for M is 12. 3) A gain condition which evidences consistently-high values of the pitch gain in the N most recent frames, N being an integer greater than 1. For example, a consistently-high pitch-gain condition is detected when the average pitch gain computed over the most recent $N+1$ pitch-gain values exceeds a given threshold; a typical value for N is 7.

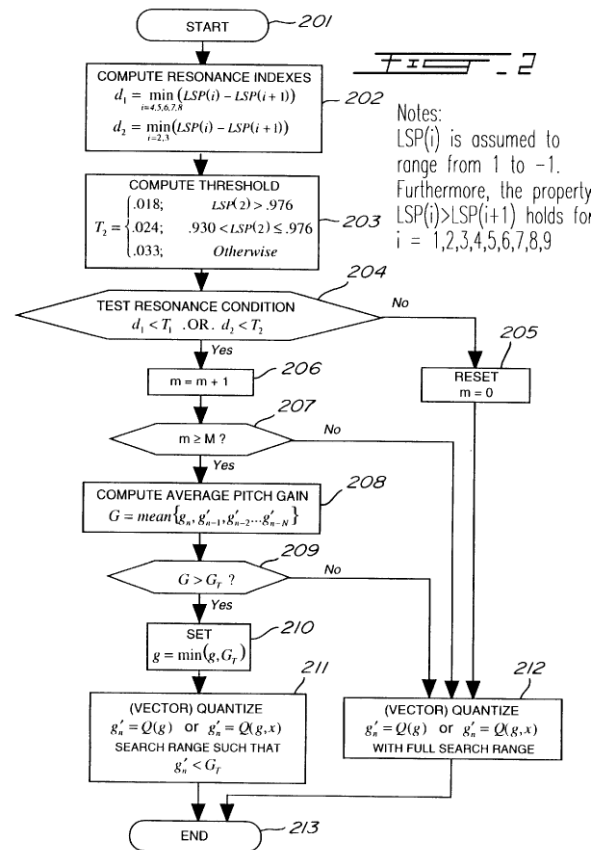
APPENDIX 7-B
U.S. PATENT 6,104,992 IS INVALID UNDER 35 U.S.C. 102
IN LIGHT OF U.S. PATENT 5,893,060 (“the ‘060 patent”)

Claims	Invalidity Based on US 5,893,060
	<p>’060 Patent, 8:30-60.</p> <p>Gain condition</p> <p>Step 209 detects a problem potential by detecting the consistently-high pitch-gain condition when the average G of the pitch gain over the N most recent frames, computed in step 208, is higher than a fixed threshold G_T, where 0.95 is a typical value for G_T according to the implementation illustrated in step 208.</p> <p>’060 Patent, 9:49-55.</p> <p>If a problem potential is detected</p> <p>Step 210 saturates the pitch gain g to G_T or another threshold (a simpler variant for step 210 consists of setting $g = G_T$ because g is expected to be large on entering this step).</p> <p>The quantization operation of step 211 takes place in vector-quantization module 104 under instructions from the instability-eradication module 105 to limit the search range to codevectors corresponding to quantized pitch gains lower than G_T or similar value.</p> <p>’060 Patent, 9:62-10:3.</p> <p>The instability-eradication module 105 is used in conjunction with the encoder 101. Its purpose is to identify frames with problem potential and, whenever such frames occur, to saturate the current pitch gain g to a given value and to cause the quantized version of the pitch gain to assume a value lower than unity in the vector quantization process. This result is best obtained by limiting the vector-quantizer search range to those entries for which the corresponding quantized pitch gain assumes indeed the above mentioned value lower than unity.</p> <p>’060 Patent, 8:30-39.</p> <p>In essence, steps 201 through 204 determine whether or not a resonance condition prevails in the input speech signal to be encoded. If a resonance condition is detected, steps 206 and 207 determine whether the duration, during which the resonance condition has been prevailing, exceeds a given number of frames (duration condition). If this duration condition is detected, a problem potential is recognized if the (weighted) average pitch gain is above a given threshold and the current pitch gain is above a certain threshold G_T. When a problem potential is recognized, the quantized pitch gain g'_n is caused to stay below a certain threshold (e.g.: G_T) in step 211 by limiting the search range of the vector quantization module 104 (FIG. 1).</p>

APPENDIX 7-B
U.S. PATENT 6,104,992 IS INVALID UNDER 35 U.S.C. 102
IN LIGHT OF U.S. PATENT 5,893,060 (“the ‘060 patent”)

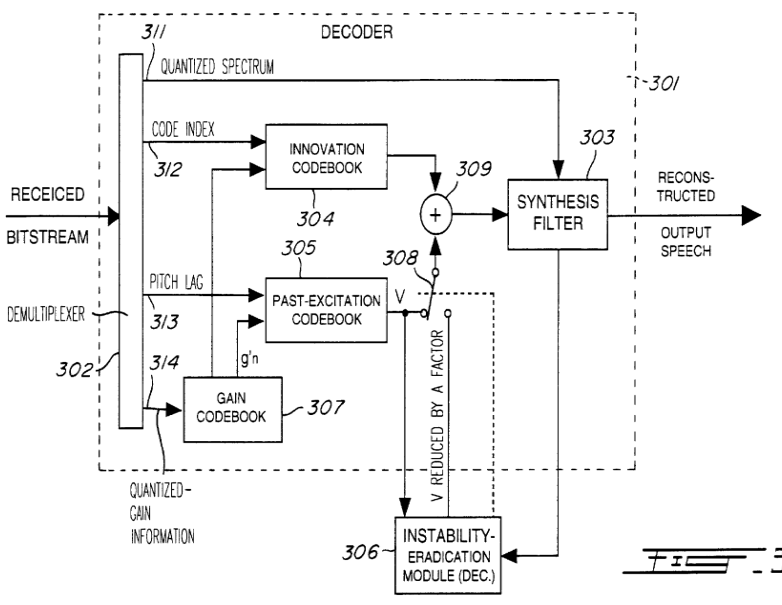
Claims**Invalidity Based on US 5,893,060**

'060 Patent, 9:1-14.



'060 Patent, Fig. 2.

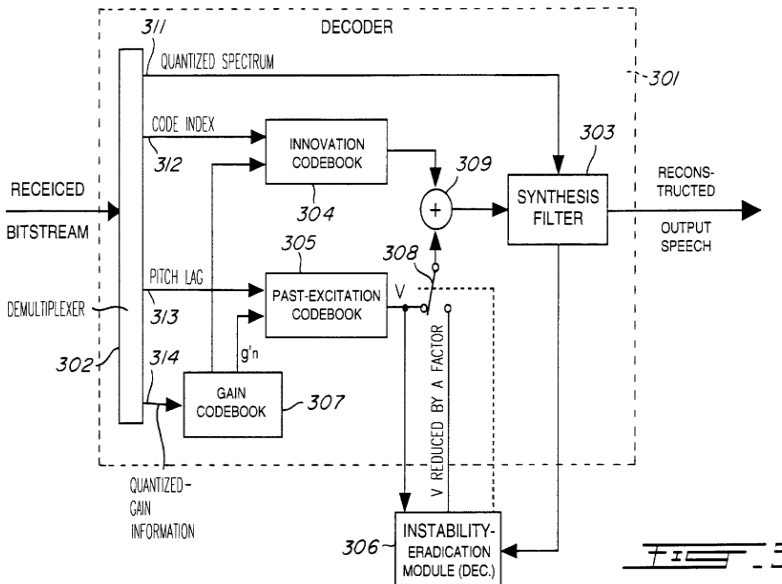
APPENDIX 7-B
U.S. PATENT 6,104,992 IS INVALID UNDER 35 U.S.C. 102
IN LIGHT OF U.S. PATENT 5,893,060 (“the ‘060 patent”)

Claims	Invalidity Based on US 5,893,060
	 <p>The diagram illustrates a speech decoder system (Fig. 3) enclosed in a dashed box labeled 'DECODER'. A 'RECEIVED BITSTREAM' enters from the left and passes through a 'DEMULTIPLEXER' (302). The demultiplexer outputs four signals: 'QUANTIZED SPECTRUM' (3/1), 'CODE INDEX' (3/2), 'PITCH LAG' (3/3), and 'QUANTIZED-GAIN INFORMATION' (3/4). The 'QUANTIZED SPECTRUM' (3/1) is fed into a 'SYNTHESIS FILTER' (303). The 'CODE INDEX' (3/2) is fed into an 'INNOVATION CODEBOOK' (304). The 'PITCH LAG' (3/3) is fed into a 'PAST-EXCITATION CODEBOOK' (305). The 'QUANTIZED-GAIN INFORMATION' (3/4) is fed into a 'GAIN CODEBOOK' (307). The output of the 'INNOVATION CODEBOOK' (304) is fed into a summing junction (+) (309). The output of the 'PAST-EXCITATION CODEBOOK' (305) is fed into a summing junction (+) (308). The output of the 'GAIN CODEBOOK' (307) is fed into a block labeled 'V REDUCED BY A FACTOR' (306). The output of the 'V REDUCED BY A FACTOR' (306) is fed into the summing junction (+) (308). The output of the summing junction (+) (308) is fed into the summing junction (+) (309). The output of the summing junction (+) (309) is fed into the 'SYNTHESIS FILTER' (303). The output of the 'SYNTHESIS FILTER' (303) is labeled 'RECONSTRUCTED OUTPUT SPEECH'.</p> <p>'060 Patent, Fig. 3.</p>
<p>3. The speech system of claim 2 wherein the processing circuit identifies the adaptive gain factor by considering, at least in part, an encoding bit rate.</p>	
<p>7[a] A speech system using an analysis by synthesis approach on a speech signal, the speech system comprising:</p>	<p>To the extent this limitation is satisfied by the functionality accused in Plaintiff's 11/23/09 infringement contentions, this limitation is disclosed in the prior art. For example, without limitation, the '060 patent discloses:</p> <p style="padding-left: 40px;">A method and device eradicate the occasional instability inherent in analysis-by-synthesis speech/audio codecs and caused in particular by channel errors during transmission of highly periodic signals such as high-frequency sine waves. Analysis-by-synthesis techniques involve production, in response to the</p>

APPENDIX 7-B
U.S. PATENT 6,104,992 IS INVALID UNDER 35 U.S.C. 102
IN LIGHT OF U.S. PATENT 5,893,060 (“the ‘060 patent”)

Claims	Invalidity Based on US 5,893,060
	<p>speech/audio signal and at regular time intervals called frames, of (a) a set of spectral parameters for use in driving a synthesis filter in view of synthesizing the speech/audio signal, and (b) a pitch gain for constructing a past-excitation-signal component supplied to the synthesis filter. In accordance with the instability eradication method, the first step consists of detecting a set of conditions including (i) a resonance condition assessed from the spectral parameters, (ii) a duration condition detected when the resonance condition has prevailed for at least the M most recent frames, M being an integer greater than 1, and (iii) a gain condition which evidences consistently-high values of the pitch gain in the N most recent frames, N being an integer greater than 1. To eradicate the occasional instability, the pitch gain is reduced to a value lower than a given threshold whenever these three conditions are detected.</p> <p>‘060 Patent, Abstract.</p> <p>The present invention is concerned with the field of digital encoding of speech, audio and other signals based on analysis-by-synthesis techniques including, in particular but not exclusively, Multipulses, Code Excited Linear Prediction (CELP) and Algebraic-Code Excited Linear Prediction (ACELP). More specifically, the present invention relates to the eradication of an occasional instability found in these analysis-by-synthesis techniques.</p> <p>‘060 Patent, 1:8-16.</p>
[7b] a adaptive codebook;	To the extent this limitation is satisfied by the functionality accused in Plaintiff’s 11/23/09 infringement contentions, this limitation is disclosed in the prior art. For example, without limitation, the ‘060 patent discloses:

APPENDIX 7-B
U.S. PATENT 6,104,992 IS INVALID UNDER 35 U.S.C. 102
IN LIGHT OF U.S. PATENT 5,893,060 (“the ‘060 patent”)

Claims	Invalidity Based on US 5,893,060
	 <p>The diagram illustrates a speech decoder (301) that processes a received bitstream. The bitstream enters a demultiplexer (302) which splits it into four components: a quantized spectrum (311), a code index (312), a pitch lag (313), and quantized-gain information (314). The code index (312) is fed into an innovation codebook (304). The pitch lag (313) is fed into a past-excitation codebook (305). The quantized-gain information (314) is fed into a gain codebook (307). The output of the gain codebook (307) is multiplied by a factor g^n and then added to the output of the past-excitation codebook (305) at a summing junction (308). The output of the summing junction (308) is then added to the output of the innovation codebook (304) at another summing junction (309). The output of the summing junction (309) is fed into a synthesis filter (303). The quantized spectrum (311) is also fed into the synthesis filter (303). The output of the synthesis filter (303) is the reconstructed speech output. An instability-eradication module (306) is connected to the output of the synthesis filter (303) and provides feedback to the past-excitation codebook (305). The module (306) is labeled 'INSTABILITY-ERADICATION MODULE (DEC.)' and 'V REDUCED BY A FACTOR'.</p> <p>'060 Patent, Fig. 3.</p> <p>The decoder 301 of FIG. 3 comprises a demultiplexer 302 for demultiplexing the bitstream received from the encoder 101 of FIG. 1 into a quantized spectrum 311 (corresponding to transmitted spectrum 111), a code index 312 (corresponding to transmitted code index 112), a pitch lag 313 (corresponding to transmitted pitch lag 113) and to quantized-gain information 314 (corresponding to transmitted quantized gains 114). The reconstructed speech is outputted from a synthesis filter 303. This synthesis filter 303 is excited by the sum of two components, namely (a) a codevector from an innovation codebook 304 in response to the code index information 312 and the code gain extracted from the quantized gain information 314 by a gain codebook 307, and (b) a past-excitation component v from a past-excitation-codebook 305 in response to the received pitch-lag information 313 and the pitch gain retrieved by the gain codebook 307 from the quantized-gain information 314. The spectrum 311 is also used to drive the synthesis filter 303. More specifically, a periodic excitation signal is applied to the synthesis filter 303 to produce the desired output speech, this periodic excitation signal being constructed by adding the received innovation signal to a past-excitation-signal</p>

APPENDIX 7-B
U.S. PATENT 6,104,992 IS INVALID UNDER 35 U.S.C. 102
IN LIGHT OF U.S. PATENT 5,893,060 (“the ‘060 patent”)

Claims	Invalidity Based on US 5,893,060
	<p>component, more precisely to the excitation signal a pitch-lag ago multiplied by the pitch gain. Whenever the frame duration is longer than the pitch lag, the frame is filled by repeating the past excitation according to the well known adaptive codebook technique.</p> <p>‘060 Patent, 6:58-7:17.</p>
<p>[7c] a fixed codebook;</p>	<p>To the extent this limitation is satisfied by the functionality accused in Plaintiff’s 11/23/09 infringement contentions, this limitation is disclosed in the prior art. For example, without limitation, the ‘060 patent discloses:</p> <div data-bbox="865 685 1642 1269" data-label="Diagram"> </div> <p>‘060 Patent, Fig. 3.</p> <p>The decoder 301 of FIG. 3 comprises a demultiplexer 302 for demultiplexing the bitstream received from the encoder 101 of FIG. 1 into a quantized spectrum 311 (corresponding to transmitted spectrum 111), a code</p>

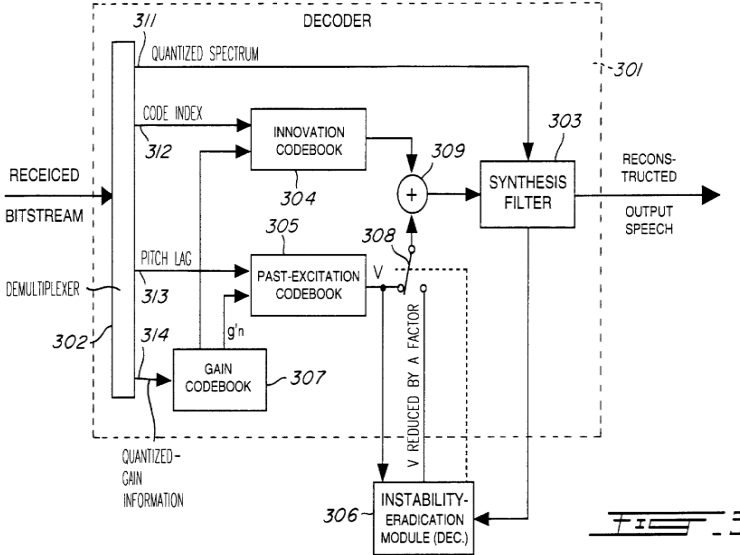
APPENDIX 7-B
U.S. PATENT 6,104,992 IS INVALID UNDER 35 U.S.C. 102
IN LIGHT OF U.S. PATENT 5,893,060 (“the ‘060 patent”)

Claims	Invalidity Based on US 5,893,060
	<p>index 312 (corresponding to transmitted code index 112), a pitch lag 313 (corresponding to transmitted pitch lag 113) and to quantized-gain information 314 (corresponding to transmitted quantized gains 114). The reconstructed speech is outputted from a synthesis filter 303. This synthesis filter 303 is excited by the sum of two components, namely (a) a codevector from an innovation codebook 304 in response to the code index information 312 and the code gain extracted from the quantized gain information 314 by a gain codebook 307, and (b) a past-excitation component v from a past-excitation-codebook 305 in response to the received pitch-lag information 313 and the pitch gain retrieved by the gain codebook 307 from the quantized-gain information 314. The spectrum 311 is also used to drive the synthesis filter 303. More specifically, a periodic excitation signal is applied to the synthesis filter 303 to produce the desired output speech, this periodic excitation signal being constructed by adding the received innovation signal to a past-excitation-signal component, more precisely to the excitation signal a pitch-lag ago multiplied by the pitch gain. Whenever the frame duration is longer than the pitch lag, the frame is filled by repeating the past excitation according to the well known adaptive codebook technique.</p> <p>‘060 Patent, 6:58-7:17.</p>
<p>[7d] a processing circuit that generates a first contribution from the adaptive codebook and a second contribution from the fixed codebook; and</p>	<p>To the extent this limitation is satisfied by the functionality accused in Plaintiff’s 11/23/09 infringement contentions, this limitation is disclosed in the prior art. For example, without limitation, the ‘060 patent discloses a processing circuit (e.g., Speech Encoder/Decoder of Figs. 1-3) that generates a first contribution from the adaptive (past-excitation) codebook and a second contribution from the fixed (innovation) codebook. For example, the ‘060 patent discloses:</p> <p style="padding-left: 40px;">Analysis-by-synthesis speech encoding techniques are based on a speech production model involving as shown in FIG. 1 the production of:</p> <ul style="list-style-type: none"> (a) a quantized spectrum 111 described by a set of P spectral coefficients, where P is the order; (b) a description of an innovation signal typically by way of a code index 112 and a code gain (included in the quantized-gain information 114); (c) a pitch lag 113; and (d) a pitch gain (included in the quantized gains 114).

APPENDIX 7-B
U.S. PATENT 6,104,992 IS INVALID UNDER 35 U.S.C. 102
IN LIGHT OF U.S. PATENT 5,893,060 (“the ‘060 patent”)

Claims	Invalidity Based on US 5,893,060
	<p data-bbox="520 329 798 362">‘060 Patent, 6:43-53.</p> <div data-bbox="798 357 1680 876"> </div> <p data-bbox="520 901 772 933">‘060 Patent, Fig. 1.</p> <p data-bbox="569 971 1976 1440">The decoder 301 of FIG. 3 comprises a demultiplexer 302 for demultiplexing the bitstream received from the encoder 101 of FIG. 1 into a quantized spectrum 311 (corresponding to transmitted spectrum 111), a code index 312 (corresponding to transmitted code index 112), a pitch lag 313 (corresponding to transmitted pitch lag 113) and to quantized-gain information 314 (corresponding to transmitted quantized gains 114). The reconstructed speech is outputted from a synthesis filter 303. This synthesis filter 303 is excited by the sum of two components, namely (a) a codevector from an innovation codebook 304 in response to the code index information 312 and the code gain extracted from the quantized gain information 314 by a gain codebook 307, and (b) a past-excitation component v from a past-excitation-codebook 305 in response to the received pitch-lag information 313 and the pitch gain retrieved by the gain codebook 307 from the quantized-gain information 314. The spectrum 311 is also used to drive the synthesis filter 303. More specifically, a periodic excitation signal is applied to the synthesis filter 303 to produce the desired output speech, this periodic excitation signal being constructed by adding the received innovation signal to a past-excitation-signal component, more precisely to the excitation signal a pitch-lag ago multiplied by the pitch gain. Whenever the</p>

APPENDIX 7-B
U.S. PATENT 6,104,992 IS INVALID UNDER 35 U.S.C. 102
IN LIGHT OF U.S. PATENT 5,893,060 (“the ‘060 patent”)

Claims	Invalidity Based on US 5,893,060
	<p>frame duration is longer than the pitch lag, the frame is filled by repeating the past excitation according to the well known adaptive codebook technique.</p> <p>‘060 Patent, 6:58-7:17.</p>  <p>The diagram illustrates a decoder (301) that processes a received bitstream (302) through a demultiplexer (302) to extract three inputs: a quantized spectrum (3/1), a code index (3/2), and a pitch lag (3/3). The quantized spectrum (3/1) is fed into a synthesis filter (303). The code index (3/2) is used to access an innovation codebook (304). The pitch lag (3/3) is used to access a past-excitation codebook (305). A gain codebook (307) provides a gain value g^n to the past-excitation codebook (305). The outputs of the innovation codebook (304) and the past-excitation codebook (305) are summed at a summing junction (309). The output of the summing junction (309) is fed into the synthesis filter (303). The synthesis filter (303) also receives the quantized spectrum (3/1) and produces a reconstructed output speech signal. An instability-eradication module (306) receives the output of the summing junction (309) and provides a feedback signal V reduced by a factor to the past-excitation codebook (305).</p> <p>’060 Patent, Fig. 3.</p>
<p>[7e] the processing circuit applying gain reduction to the first contribution from the adaptive codebook then regenerating the second contribution from the fixed codebook.</p>	<p>To the extent this limitation is satisfied by the functionality accused in Plaintiff’s 11/23/09 infringement contentions, this limitation is disclosed in the prior art. For example, the ‘060 patent discloses a processing circuit (<i>e.g.</i>, Speech Encoder/Decoder of Figures 1-3) that, under certain conditions, applies “gain reduction” to the “first contribution” from the adaptive (past-excitation) codebook by limiting the adaptive codebook gain g to the threshold value G_T. <i>See e.g.</i>, Steps 209-210 of Fig. 2. The ‘060 patent further discloses that the adaptive codebook gain g and the fixed codebook gain x are jointly quantized (in some embodiments) by using a vector quantization technique. <i>See e.g.</i>, Step 211 of Fig. 2. In such situations, the vector quantized value of the fixed codebook gain x, which is used for generating the “second contribution” from the fixed codebook, will be based in part on the value of the adaptive codebook gain g. Thus, after applying the threshold value G_T to the adaptive codebook gain g, the Speech Encoder/Decoder “regenerates” the fixed codebook contribution by identifying the</p>

APPENDIX 7-B
U.S. PATENT 6,104,992 IS INVALID UNDER 35 U.S.C. 102
IN LIGHT OF U.S. PATENT 5,893,060 (“the ‘060 patent”)

Claims	Invalidity Based on US 5,893,060
	<p>vector quantized value of the fixed codebook gain x, which is based in part on the threshold limited value of g (<i>i.e.</i>, where $g = G_T$). For example, without limitation, the ‘060 patent discloses:</p> <p>According to the invention, the instability eradication method comprises a detection step for detecting a set of conditions related to the spectral parameters and the pitch gain, and a modification step for reducing the pitch gain to a value lower than a given threshold whenever the conditions of the above mentioned set are detected in order to eradicate the occasional instability.</p> <p>’060 Patent, 2:18-24.</p> <p>The modification step may comprise the step of reducing a quantized version of the pitch gain to a value lower than a given threshold G_T whenever the conditions of the above mentioned set are detected in order to eradicate the occasional instability.</p> <p>’060 Patent, 2:44-48.</p> <p>Switch 110 is normally in the position as shown in FIG. 1. In this case, the instability-eradication module 105 does not interfere with normal operation of the encoder 101; indeed the pitch gain g outputted from module 103 is passed untouched to the quantization module 104. If however, the instability-eradication module 105 identifies a problem potential, it will change the position of switch 110 thereby saturating the current pitch gain g to some value (e.g.: G_T) and will cause the quantized pitch gain included in the output of gain vector-quantization module 104 to be limited to a value lower than a given threshold (e.g.: G_T).</p> <p>’060 Patent, 7:50-60.</p> <p>The instability-eradication module 105 is used in conjunction with the encoder 101. Its purpose is to identify frames with problem potential and, whenever such frames occur, to saturate the current pitch gain g to a given value and to cause the quantized version of the pitch gain to assume a value lower than unity in the vector quantization process. This result is best obtained by limiting the vector-quantizer search range to those entries for which the corresponding quantized pitch gain assumes indeed the above mentioned value lower than unity.</p> <p>A frame with problem potential is identified whenever the three following conditions are detected:</p>

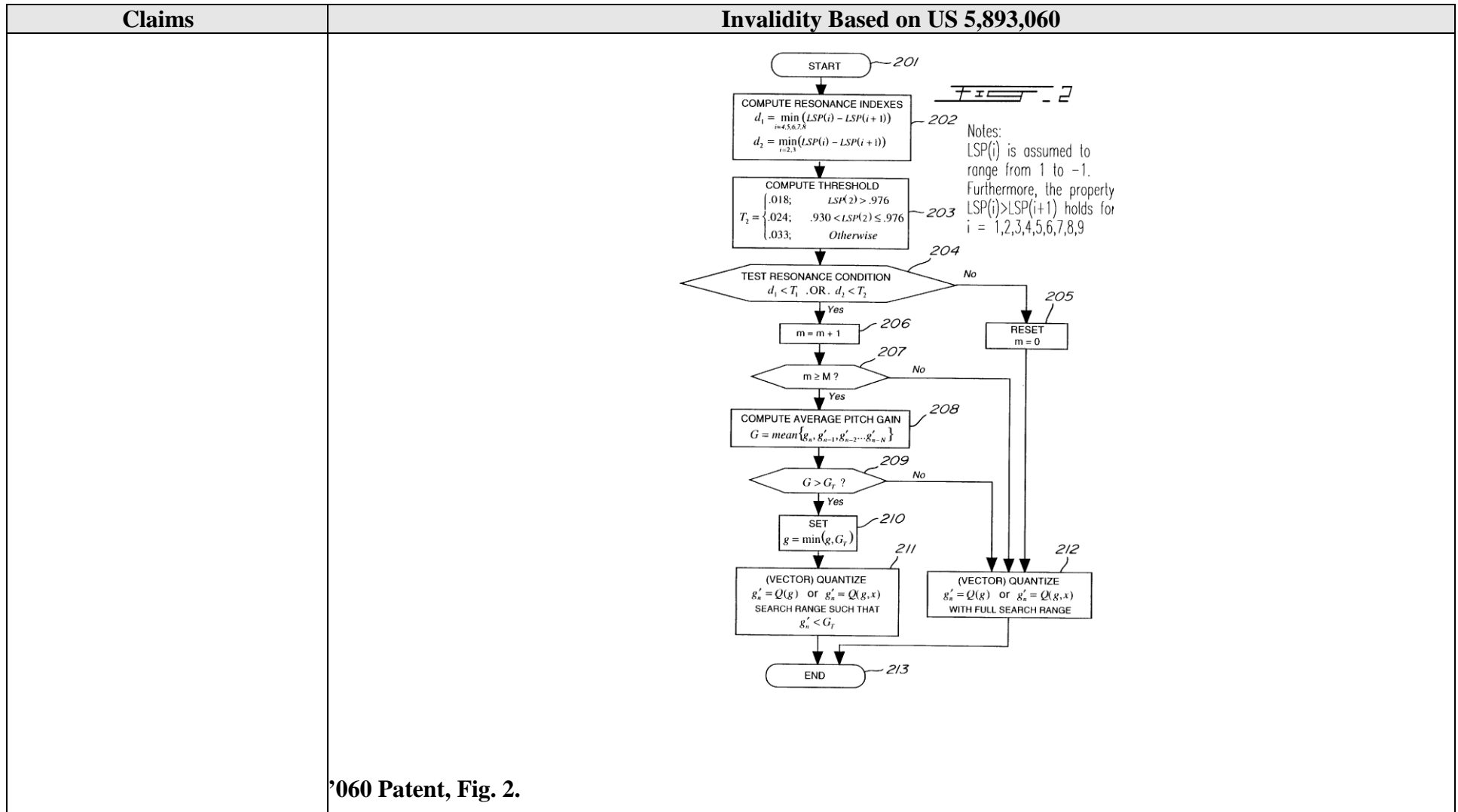
APPENDIX 7-B
U.S. PATENT 6,104,992 IS INVALID UNDER 35 U.S.C. 102
IN LIGHT OF U.S. PATENT 5,893,060 (“the ‘060 patent”)

Claims	Invalidity Based on US 5,893,060
	<p>1) A resonance condition prevails in the input signal to be encoded. In other words a highly correlated stationary signal is present. A typical signal having these characteristics is a sinusoidal tone or a combination of tones. The present specification discloses an efficient approach to assessing resonance conditions by monitoring the occurrence of resonance in the LSP-spectrum already available in the encoder.</p> <p>2) A duration condition is detected when the resonance condition has prevailed for at least the M most recent frames where M is an integer greater than 1; a typical value for M is 12.</p> <p>3) A gain condition which evidences consistently-high values of the pitch gain in the N most recent frames, N being an integer greater than 1. For example, a consistently-high pitch-gain condition is detected when the average pitch gain computed over the most recent N+1 pitch-gain values exceeds a given threshold; a typical value for N is 7.</p> <p>’060 Patent, 8:30-60.</p> <p>Gain condition</p> <p>Step 209 detects a problem potential by detecting the consistently-high pitch-gain condition when the average G of the pitch gain over the N most recent frames, computed in step 208, is higher than a fixed threshold G_T, where 0.95 is a typical value for G_T according to the implementation illustrated in step 208.</p> <p>’060 Patent, 9:49-55.</p> <p>If a problem potential is detected</p> <p>Step 210 saturates the pitch gain g to G_T or another threshold (a simpler variant for step 210 consists of setting $g = G_T$ because g is expected to be large on entering this step).</p> <p>The quantization operation of step 211 takes place in vector-quantization module 104 under instructions from the instability-eradication module 105 to limit the search range to codevectors corresponding to quantized pitch gains lower than G_T or similar value.</p> <p>’060 Patent, 9:62-10:3.</p> <p>The instability-eradication module 105 is used in conjunction with the encoder 101. Its purpose is to identify frames with problem potential and, whenever such frames occur, to saturate the current pitch gain g to a given</p>

APPENDIX 7-B
U.S. PATENT 6,104,992 IS INVALID UNDER 35 U.S.C. 102
IN LIGHT OF U.S. PATENT 5,893,060 (“the ‘060 patent”)

Claims	Invalidity Based on US 5,893,060
	<p>value and to cause the quantized version of the pitch gain to assume a value lower than unity in the vector quantization process. This result is best obtained by limiting the vector-quantizer search range to those entries for which the corresponding quantized pitch gain assumes indeed the above mentioned value lower than unity.</p> <p>'060 Patent, 8:30-39.</p> <p>In essence, steps 201 through 204 determine whether or not a resonance condition prevails in the input speech signal to be encoded. If a resonance condition is detected, steps 206 and 207 determine whether the duration, during which the resonance condition has been prevailing, exceeds a given number of frames (duration condition). If this duration condition is detected, a problem potential is recognized if the (weighted) average pitch gain is above a given threshold and the current pitch gain is above a certain threshold G_T. When a problem potential is recognized, the quantized pitch gain g'_n is caused to stay below a certain threshold (e.g.: G_T) in step 211 by limiting the search range of the vector quantization module 104 (FIG. 1).</p> <p>'060 Patent, 9:1-14.</p>

APPENDIX 7-B
U.S. PATENT 6,104,992 IS INVALID UNDER 35 U.S.C. 102
IN LIGHT OF U.S. PATENT 5,893,060 (“the ‘060 patent”)

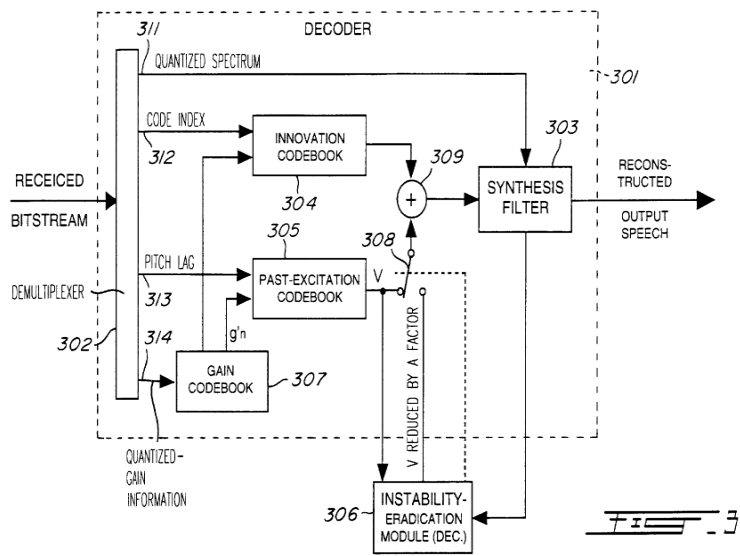


'060 Patent, Fig. 2.

APPENDIX 7-B
U.S. PATENT 6,104,992 IS INVALID UNDER 35 U.S.C. 102
IN LIGHT OF U.S. PATENT 5,893,060 (“the ‘060 patent”)

Claims	Invalidity Based on US 5,893,060
	<p>'060 Patent, Fig. 1.</p>

APPENDIX 7-B
U.S. PATENT 6,104,992 IS INVALID UNDER 35 U.S.C. 102
IN LIGHT OF U.S. PATENT 5,893,060 (“the ‘060 patent”)

Claims	Invalidity Based on US 5,893,060
	 <p>The diagram illustrates a speech decoder system (Fig. 3). A 'RECEIVED BITSTREAM' enters a 'DEMULTIPLEXER' (302). The demultiplexer outputs four signals: 'QUANTIZED SPECTRUM' (311), 'CODE INDEX' (312), 'PITCH LAG' (313), and 'QUANTIZED-GAIN INFORMATION' (314). The 'QUANTIZED SPECTRUM' (311) is fed into a 'SYNTHESIS FILTER' (303). The 'CODE INDEX' (312) is fed into an 'INNOVATION CODEBOOK' (304). The 'PITCH LAG' (313) is fed into a 'PAST-EXCITATION CODEBOOK' (305). The 'QUANTIZED-GAIN INFORMATION' (314) is fed into a 'GAIN CODEBOOK' (307). The outputs of the 'INNOVATION CODEBOOK' (304) and the 'PAST-EXCITATION CODEBOOK' (305) are combined at a summing junction (309). The output of the summing junction (309) is fed into the 'SYNTHESIS FILTER' (303). The output of the 'SYNTHESIS FILTER' (303) is 'RECONSTRUCTED OUTPUT SPEECH'. The output of the 'GAIN CODEBOOK' (307) is 'gⁿ', which is fed into an 'INSTABILITY-ERADICATION MODULE (DEC.)' (306). The output of the 'INSTABILITY-ERADICATION MODULE (DEC.)' (306) is 'V REDUCED BY A FACTOR', which is fed into the summing junction (309). The 'INSTABILITY-ERADICATION MODULE (DEC.)' (306) also receives 'QUANTIZED-GAIN INFORMATION' (314) and 'PITCH LAG' (313) as inputs. The output of the 'INSTABILITY-ERADICATION MODULE (DEC.)' (306) is 'V REDUCED BY A FACTOR', which is fed into the summing junction (309). The output of the summing junction (309) is fed into the 'SYNTHESIS FILTER' (303). The output of the 'SYNTHESIS FILTER' (303) is 'RECONSTRUCTED OUTPUT SPEECH'.</p> <p>'060 Patent, Fig. 3.</p>
<p>8. The speech system of claim 7 wherein the gain reduction comprises application of a gain factor.</p>	<p>To the extent this limitation is satisfied by the functionality accused in Plaintiff's 11/23/09 infringement contentions, this limitation is disclosed in the prior art. For example, without limitation, the '060 patent discloses:</p> <p>According to the invention, the instability eradication method comprises a detection step for detecting a set of conditions related to the spectral parameters and the pitch gain, and a modification step for reducing the pitch gain to a value lower than a given threshold whenever the conditions of the above mentioned set are detected in order to eradicate the occasional instability.</p> <p>'060 Patent, 2:18-24.</p> <p>The modification step may comprise the step of reducing a quantized version of the pitch gain to a value lower than a given threshold $G_{sub.T}$ whenever the conditions of the above mentioned set are detected in order to</p>

APPENDIX 7-B
U.S. PATENT 6,104,992 IS INVALID UNDER 35 U.S.C. 102
IN LIGHT OF U.S. PATENT 5,893,060 (“the ‘060 patent”)

Claims	Invalidity Based on US 5,893,060
	<p>eradicate the occasional instability.</p> <p>’060 Patent, 2:44-48.</p> <p>Switch 110 is normally in the position as shown in FIG. 1. In this case, the instability-eradication module 105 does not interfere with normal operation of the encoder 101; indeed the pitch gain g outputted from module 103 is passed untouched to the quantization module 104. If however, the instability-eradication module 105 identifies a problem potential, it will change the position of switch 110 thereby saturating the current pitch gain g to some value (e.g.: $G_{sub.T}$) and will cause the quantized pitch gain included in the output of gain vector-quantization module 104 to be limited to a value lower than a given threshold (e.g.: $G_{sub.T}$).</p> <p>’060 Patent, 7:50-60.</p> <p>The instability-eradication module 105 is used in conjunction with the encoder 101. Its purpose is to identify frames with problem potential and, whenever such frames occur, to saturate the current pitch gain g to a given value and to cause the quantized version of the pitch gain to assume a value lower than unity in the vector quantization process. This result is best obtained by limiting the vector-quantizer search range to those entries for which the corresponding quantized pitch gain assumes indeed the above mentioned value lower than unity.</p> <p>A frame with problem potential is identified whenever the three following conditions are detected:</p> <ol style="list-style-type: none"> 1) A resonance condition prevails in the input signal to be encoded. In other words a highly correlated stationary signal is present. A typical signal having these characteristics is a sinusoidal tone or a combination of tones. The present specification discloses an efficient approach to assessing resonance conditions by monitoring the occurrence of resonance in the LSP-spectrum already available in the encoder. 2) A duration condition is detected when the resonance condition has prevailed for at least the M most recent frames where M is an integer greater than 1; a typical value for M is 12. 3) A gain condition which evidences consistently-high values of the pitch gain in the N most recent frames, N being an integer greater than 1. For example, a consistently-high pitch-gain condition is detected when the average pitch gain computed over the most recent $N+1$ pitch-gain values exceeds a given threshold; a typical value for N is 7.

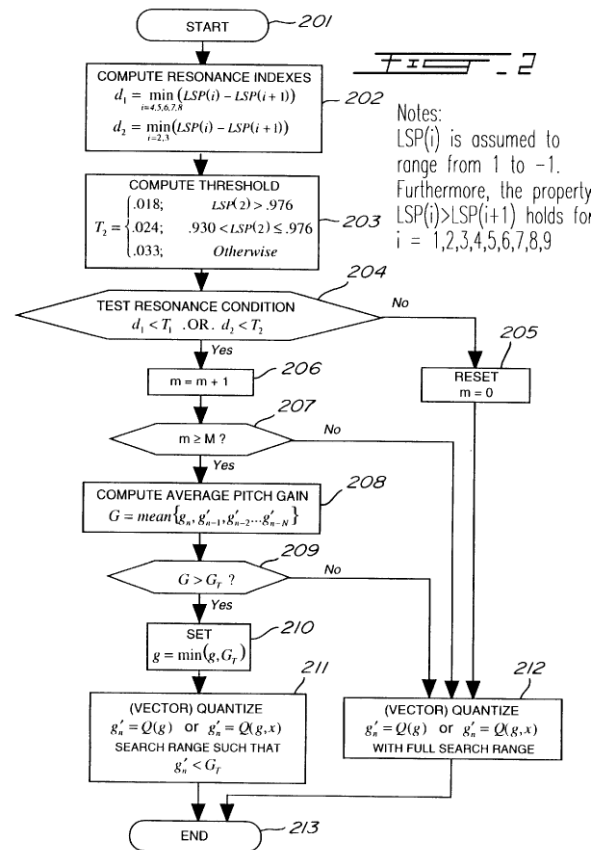
APPENDIX 7-B
U.S. PATENT 6,104,992 IS INVALID UNDER 35 U.S.C. 102
IN LIGHT OF U.S. PATENT 5,893,060 (“the ‘060 patent”)

Claims	Invalidity Based on US 5,893,060
	<p>’060 Patent, 8:30-60.</p> <p>Gain condition</p> <p>Step 209 detects a problem potential by detecting the consistently-high pitch-gain condition when the average G of the pitch gain over the N most recent frames, computed in step 208, is higher than a fixed threshold G_T, where 0.95 is a typical value for G_T according to the implementation illustrated in step 208.</p> <p>’060 Patent, 9:49-55.</p> <p>If a problem potential is detected</p> <p>Step 210 saturates the pitch gain g to G_T or another threshold (a simpler variant for step 210 consists of setting $g = G_T$ because g is expected to be large on entering this step).</p> <p>The quantization operation of step 211 takes place in vector-quantization module 104 under instructions from the instability-eradication module 105 to limit the search range to codevectors corresponding to quantized pitch gains lower than G_T or similar value.</p> <p>’060 Patent, 9:62-10:3.</p> <p>The instability-eradication module 105 is used in conjunction with the encoder 101. Its purpose is to identify frames with problem potential and, whenever such frames occur, to saturate the current pitch gain g to a given value and to cause the quantized version of the pitch gain to assume a value lower than unity in the vector quantization process. This result is best obtained by limiting the vector-quantizer search range to those entries for which the corresponding quantized pitch gain assumes indeed the above mentioned value lower than unity.</p> <p>’060 Patent, 8:30-39.</p> <p>In essence, steps 201 through 204 determine whether or not a resonance condition prevails in the input speech signal to be encoded. If a resonance condition is detected, steps 206 and 207 determine whether the duration, during which the resonance condition has been prevailing, exceeds a given number of frames (duration condition). If this duration condition is detected, a problem potential is recognized if the (weighted) average pitch gain is above a given threshold and the current pitch gain is above a certain threshold G_T. When a problem potential is recognized, the quantized pitch gain g'_n is caused to stay below a certain threshold (e.g.: G_T) in step 211 by limiting the search range of the vector quantization module 104 (FIG. 1).</p>

APPENDIX 7-B
U.S. PATENT 6,104,992 IS INVALID UNDER 35 U.S.C. 102
IN LIGHT OF U.S. PATENT 5,893,060 (“the ‘060 patent”)

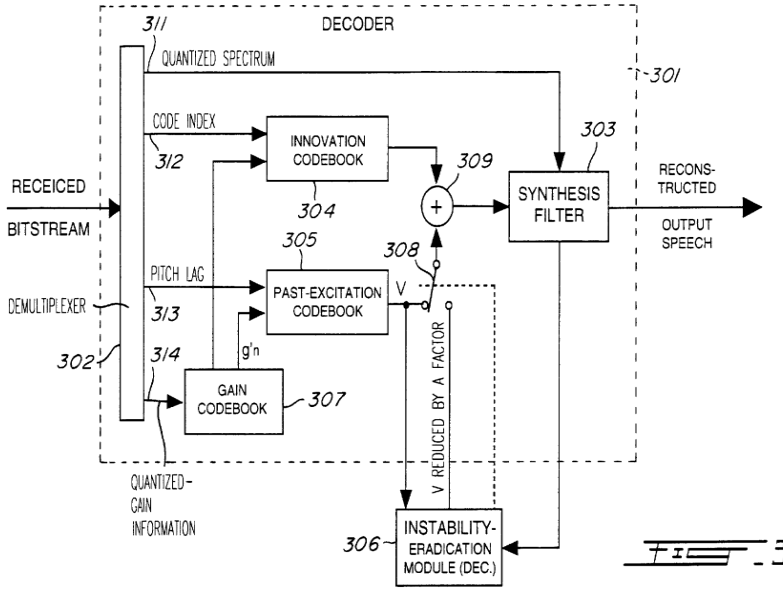
Claims**Invalidity Based on US 5,893,060**

’060 Patent, 9:1-14.



’060 Patent, Fig. 2.

APPENDIX 7-B
U.S. PATENT 6,104,992 IS INVALID UNDER 35 U.S.C. 102
IN LIGHT OF U.S. PATENT 5,893,060 (“the ‘060 patent”)

Claims	Invalidity Based on US 5,893,060
	 <p>The diagram illustrates a speech decoder system. A 'RECEIVED BITSTREAM' enters a 'DEMULTIPLEXER' (302). The demultiplexer outputs four signals: 'QUANTIZED SPECTRUM' (3/1), 'CODE INDEX' (3/2), 'PITCH LAG' (3/3), and 'QUANTIZED-GAIN INFORMATION' (3/4). The 'QUANTIZED SPECTRUM' (3/1) is input to a 'DECODER' (301) and also to a 'SYNTHESIS FILTER' (303). The 'CODE INDEX' (3/2) is input to an 'INNOVATION CODEBOOK' (304). The 'PITCH LAG' (3/3) is input to a 'PAST-EXCITATION CODEBOOK' (305). The 'QUANTIZED-GAIN INFORMATION' (3/4) is input to a 'GAIN CODEBOOK' (307). The 'INNOVATION CODEBOOK' (304) outputs to a summing junction (+) (309). The 'PAST-EXCITATION CODEBOOK' (305) outputs to a summing junction (+) (308). The 'GAIN CODEBOOK' (307) outputs to a summing junction (+) (308). The summing junction (+) (309) outputs to the 'SYNTHESIS FILTER' (303). The summing junction (+) (308) outputs to an 'INSTABILITY-ERADICATION MODULE (DEC.)' (306). The 'INSTABILITY-ERADICATION MODULE (DEC.)' (306) outputs to the 'SYNTHESIS FILTER' (303). The 'SYNTHESIS FILTER' (303) outputs 'RECONSTRUCTED OUTPUT SPEECH'. A feedback loop labeled 'V REDUCED BY A FACTOR' connects the output of the 'INSTABILITY-ERADICATION MODULE (DEC.)' (306) back to the 'PAST-EXCITATION CODEBOOK' (305). The diagram is labeled 'FIG. 3'.</p> <p>'060 Patent, Fig. 3.</p>
<p>9. The speech system of claim 8 wherein the processing circuit identifies the gain factor by considering an encoding bit rate.</p>	